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ABSTRACT

A research study compared graduates of career magnet programs to graduates of comprehensive high schools in a large metropolitan area. The career magnet programs studied are located either within regular comprehensive high schools or combined with other magnet programs to fill an entire building. Research was conducted through school records of more than 9,000 students who attended 59 programs and interviews with 110 students who had applied to 4 different career magnet high schools, comparing lottery winners to those who lost the lottery and graduated from a comprehensive high school. Two further studies were made: 4-hour interviews with 30 of the graduates and a lengthy interview with an additional 14 career magnet high schools. The study found that, to a much greater extent than their comprehensive-school counterparts, career-magnet alumni say that their parents will support them for college. At age 20, career magnet graduates report that they smoke less, drink less, study more, and take themselves and their lives more seriously than the graduates of comprehensive schools. The presence of a career focus seems to create a setting where students can move through the indecision of adolescence and build a career identity. However, the career magnet schools had a higher dropout rate than the comprehensive high schools, and many of the programs were of poor quality. Test scores were similar across both types of schools. The study concluded that the career magnet programs studied are a promising model if they can be implemented effectively. (KC)

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THE EFFECTS OF CAREER MAGNET SCHOOLS

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This Brief is a distillation of a report on a major research study comparing graduates of career magnet programs to graduates of comprehensive high schools in a large metropolitan area. The career magnet programs we studied are located either within regular comprehensive high schools or combined with other magnet programs to fill up an entire building. Many of our conclusions are based on comparisons of a large number of students who had been randomly assigned—through a lottery admission process—either to magnet programs or to comprehensive high schools.

Drawing on school records on over 9,000 students who attended 59 programs, the researchers interviewed 110 students who had applied to four different career magnet high schools, comparing lottery winners to those who lost the lottery and graduated from a comprehensive high school. Two further studies—four-hour interviews with 30 of the graduates and a lengthy interview with an additional 14 career magnet graduates—explored the lives and high school experiences of the respondents in an attempt to discover the reasons for the successes and failures of the career magnet high schools.

The selection process and the study design. In this metropolitan area, every middle school student in the area is required to fill out an application for high school, using a form that makes applying to a magnet school as easy as possible. Each career magnet program can admit only one-sixth of its students from those with above-grade-level reading scores, and another one-sixth from those with below-grade-level reading scores. Finally, half the students have to be admitted by lottery, and separate lotteries are conducted

for students with high, average, and low reading scores.

We used the school district's method of assigning students by lottery as the basis for our study. Thus, the students were randomly assigned to different treatments, and we took outcome measures after the students received the treatment. In all of our research, we studied only those students who were admitted by lottery to career magnet high schools and graduated from them, comparing them to lottery-losing applicants to the same schools who had graduated from comprehensive high schools. The students had chosen the same program, were in the same reading ability groups, and were matched in terms of income. Although not a perfect experiment, we consider the study as being based on an experimental model. This is the largest study ever done of an educational program using random assignment.

Graduation and Dropout Rates

Many of the career magnet programs that we studied had lower graduation rates than the comprehensive schools. Only 26 percent of the lottery winners graduated high school at the end of the fourth year; 31 percent of the lottery losers graduated after four years. The comparisons are the same when we look at dropouts. At the end of the third year of high school, 7 percent of the lottery winners had dropped out of school, compared to 6 percent of the lottery losers. After the fourth year of high school, 14 percent of the lottery winners had dropped out; 11 percent of the lottery losers had dropped out.

Based on our research, comprehensive schools are graduating four students for every three that career magnets graduate. The career magnets' lower graduation rate and higher dropout rate are both of considerable policy importance and are statistically significant. Our research reveals that the lottery winners were not academically inferior to the lottery losers, so the lower graduation rate cannot be

explained by a difference in academic ability. Since there are seemingly obvious reasons—among them, the career focus and the integration of academics with career preparation—that career magnets should be more successful than comprehensive schools at holding students and graduating them, these findings are surprising.

We pose the following possible explanations for these findings. A fundamental problem with career magnet high schools is the conflict between providing students with the best education and providing employers with qualified workers. Ironically, schools are forced to set higher standards to satisfy their commitments to prepare students for employment—in some cases, in entry-level jobs—than they would if they were providing education only good enough for graduation and application for admission to college. Since some students cannot meet the standards, the higher standards lead to a lower graduation rate. The relative pay-offs to the high school are clear: dissatisfied employers can harm the program by not taking interns or by criticizing the school among their colleagues. But when a college rejects a student, it doesn't hold the program responsible; the college simply concludes that this is one of the program's weaker students.

Further, some career magnets set quotas for the program's junior year. To select students who can meet the higher demands, career magnets often drop all but a small proportion of students from the program. One business program we visited ranked its second-year students and kept only the thirty highest-ranked students; the rest became members of the comprehensive school. In other career magnets, the lower-ranked students remained in the program but did not get into internships or advanced classes. Over half of the programs we visited used some variation of this process.

In some programs, the dropped students continued in high school either by being in the magnet program in name only while taking the same cours-

es as the comprehensive school students, or by being provided an alternate set of courses in a "safety net" program. Some program administrators said that they were required to return the dropped students to their neighborhood school. Others, instead of dropping weak students, modified the program to accommodate them. For example, one magnet retained its weak students but assigned them to in-house internships—clerical work within the school—instead of sending them out to work.

The Academic Effects of Career Magnets

The career magnet graduates that we studied did not have higher or lower reading scores than the comprehensive high school graduates. Nor did they have higher or lower absenteeism. However, they did have slightly lower math scores. Proponents of school-to-work will be disappointed by these results, since they have argued that adding a career focus should enhance academics by increasing student motivation. Advocates of choice will also be disappointed since they expected the schools to perform better simply because the free market should have weeded out the weaker programs. On the other hand, advocates of school reform can be reassured that the career magnets were able to introduce their career focus and all its attendant work on adolescent development without test scores declining.

Two factors had significant effects on academic achievement in some of these programs—one positive and one negative:

Computers. Students in programs with a high level of computer usage showed significant improvement in math scores. The gains were large despite a 50 percent increase in the number of students taking the advanced math tests. We do not think that the improvement in math scores was a direct effect of teaching math via computer. Computers were actually used more often in career-related classes, such as accounting or secre-

tarial classes. The improvement in attendance on the standardized tests suggests that part of the impact of computers is motivational rather than simply cognitive. Students who can master computers may be more confident about their abilities to deal with mathematics. Or it may simply be that the pleasure of working with computers lessens the drudgery of academic classes.

Job placement programs. Our data indicate that programs that took students into the workplace and prepared them for jobs immediately after graduation had negative effects on academic performance. There is little in the culture of such programs that leads either the staff or the students to press for higher levels of academic achievement. Indeed, a commitment to placing a student in employment after graduation seems to lead to a de-emphasis on academic performance. This may be the result of competition for the student's time. To reach the level of performance required by employers, the school must invest more time training students to meet those performance standards, leaving less time for academics. Several other attempts at employment focus—such as having guest speakers from industry, or using mentors—show neither positive nor negative academic effects. Although there are presumably strong non-cognitive benefits attached to internship programs and mentoring, our data found no impact on test scores.

The Design of Career Magnet Programs

In theory, career magnet schools and programs offer a systematic alternative to the prevailing conditions of large-scale curricular fragmentation, passive pedagogy, and student anonymity. Career magnets embrace a dual mission of college and career preparation, to be achieved via explicit connections between occupational and academic coursework within school and well-structured links between coursework and work-based learning

outside of school. In lengthy interviews with 14 career magnet graduates about their high school experiences, and subsequent interviews with school personnel, we found that 6 of the 14 students had experienced a high school education that roughly matched the magnet school theoretical model; the experience of the other 8 students did not. We call these "good-fit" and "poor-fit" cases.

Career focus. With a few exceptions, the academic transcripts of all 14 graduates reveal strong sequences of program-related classes. However, the ways in which the two groups of graduates perceived and experienced their program classes differed tremendously. While the good-fit graduates spoke clearly about the specialized curriculum and a sequence of related coursework in their programs, the poor-fit graduates were generally unable to see any meaningful focus in their curriculum or to remember a sequence of courses in which they built a recognizable body of knowledge and skills in a particular occupational area.

Curricular integration. All 14 experienced a curricular "disconnect" between academic and occupational coursework. Virtually none of these graduates recalled encountering the kind of curriculum integration envisioned by the advocates of vocational reform. The academic teachers with whom we spoke valued the motivation shown by students in career-focused programs but did not see the integration of curriculum as necessary or even desirable. Several occupational teachers agreed that links between academic and occupational curricula could be beneficial; however, only two of them had relationships with academic teachers that would permit even limited integration.

Integration between coursework and work-based learning was equally illusive. In only two of the 14 cases did we find examples of explicit connections between program coursework and practical work experience, and the connection in one of those was weak.

Active pedagogy. The project-based, problem-solving, learning-through-doing pedagogy thought to be associated with career magnet programs was largely absent in the graduates' recollections of high school, though more evident in the good-fit cases. The picture that emerges, particularly in the poor-fit cases, is one of conventional whole-class lecture instruction and textbook-based assignments. Although some of the students experienced active pedagogy in class work requiring the use of workplace technology, the limited evidence of active pedagogy in these cases stands out only against the paucity of similar experiences reported by the poor-fit graduates.

Structured workplace learning. The high school experience of the two groups of students differed dramatically on this dimension. All of the good-fit cases completed required internships, supervised practice, or program-related placements. In contrast, while two of the poor-fit cases had jobs through school co-op programs, none of them participated in structured work experience aligned with or provided by their career magnet program.

Academic performance. The high school experiences of the two groups we labeled "good-fit" and "poor-fit" differed in clear and visible ways: they encountered quite different levels of program coherence and focus. Good-fit graduates enjoyed meaningful program-related work placements; the others did not. Do these differences of context and design affect academic performance? We used three indicators: cumulative grade point average, record of failed classes, and incidence of on-time graduation.

Grade point average: At the end of ninth grade, good-fit graduates had a mean GPA of 73.8; poor-fits, 69.3. By the time they graduated, the mean GPA of the good-fits was up 3.5 points; the poor-fit mean was up as well, but not as much, 2.7 points. The good-fit graduates had entered high school with slightly higher reading test scores (58

vs. 56.9) and higher math scores (75.8 vs. 70.6), which may explain their higher GPAs. Nonetheless, the GPA gap of 4.5 points that existed between the two groups at the end of ninth grade had widened to over 6 points by the end of 12th grade.

Record of failed classes: Although one good-fit graduate failed 13 classes (but only one of them after joining her career program in 11th grade), the other good-fit cases failed far fewer classes than the poor-fit graduates.

On-time graduation: All six good-fit students graduated in four years, although the one who failed 13 classes needed summer and night school to finish on time. The poor-fit cases had a poorer record: two students failed over 20 classes and needed five years to graduate.

Overall, we did not find a meaningful difference in achievement between the two groups. While the good-fits as a group had a slightly higher GPA, 12 of the 14 cases were low to mid-range achievers. However, the difference in the number of classes failed may be related to striking differences in the value the two groups attached to what they learned in high school. The good-fit graduates placed a higher value on their high school experience than did the poor-fit graduates—in part because these individual students treated high school more seriously, but also because of the greater program coherence in the schools they attended.

Effects on Student Behavior

For many students, career magnets seem to create an environment in which behaviors that foster life success are more likely to occur. This analysis is based on interviews with 110 graduates—51 who had graduated from a career magnet program and 59 who had applied to the same career magnet but had lost the lottery and graduated from a comprehensive high school. Based on what the interviewees reported to us, we found that career magnet graduates were significantly less likely

to have ever been in a fight during or since high school, to have ever smoked, to drink alcohol at least weekly, use drugs, or ever become pregnant or make someone pregnant. In sum, 41 percent of career magnet graduates reported none of the above risk factors, while only 19 percent of the comprehensive high school graduates fell into the "no-reported-risk-behaviors" category. Indeed, the reduced incidence of these high-risk behaviors constituted the biggest differences between career magnet and comprehensive graduates.

And even though the families from both types of schools were matched in terms of income, career magnet graduates were more likely to believe that their parents were willing to support their college plans. Magnet school students were more likely to socialize with students from their schools than from their neighborhoods, and to have a "best friend" with career plans. One's best friend in high school is an important transmitter of social norms and values. Thus, in addition to whatever career focus is present in the curriculum, enrollment in a career magnet exposes a student to an environment in which career thinking and career planning are normative.

Our best guess is that career magnet schools promote positive behaviors by creating a school culture that supports hard work, dedication, and continuity of purpose. A shared commitment to a general career area leads to a culture that promotes career discussion, career and college planning, and realism about the future, instilling a "career identity" in the students and helping them with their adolescent development. The daily experience of students is as important as the instruction that they receive in the classroom. When implemented well, the career-focused school supports a community of practice, sustained relationships, and offers complex new challenges that engage students. If students are lucky enough to be in a good program and get an internship, they learn about what the larger world expects of them.

Summary and Conclusions

To a much greater extent than their comprehensive-school counterparts, career-magnet alumni say that their parents will support them for college. In addition, they take more college courses and rein in the reckless behavior of adolescence. At age 20, career magnet graduates report that they smoke less, drink less, study more, and generally take themselves and their lives more seriously than the graduates of comprehensive schools. These striking outcomes show the great power that high schools have to shape the development of adolescents.

The presence of a career focus seems to create a setting where students can move through the indecision of adolescence and build a career identity. The adolescents in the schools that we studied do not have family businesses or connections, and they have little knowledge of what good jobs might be available. Many of these students believe that their only hope is to live a life considerably different from their parents. Developing a career goal helps strengthen the student's identity. That career identity may be the basis for their staying away from adolescent escapism in risky behavior and give them the self-control that encourages their parents to invest in their future.

Abstract academic education not connected to a specific career can be satisfying only to those students who are certain they will get a four-year college degree that will meet their career-preparation needs. Contrasted with the traditional high school, career magnets can command the loyalty of their students and offer them an opening to a future career that does not require them to be part of the academic elite.

Unfortunately, in many magnet programs that goal is not achieved for all students, and perhaps not even pursued. Our study documents considerable implementation failure. The career magnet programs that we studied seem to fail as often as they succeed. Many did not create a coherent academic-career program. Some students

reported being admitted to a career magnet program only to find no program when they got there. Perhaps only half of the career-magnet students had been in a program that would meet a reasonable standard of what a career magnet program should be. Our study dealt only with graduates, and only a minority had graduated five years after entry—and the career magnets had lower graduation rates than the comprehensive high schools. Had our sample included high school dropouts, it is possible that we would have found even more poor-quality programs.

The research did find a number of programs that fit the definition of a career magnet, and it is clear that some students in these programs received something special—a high school experience in a setting that supported hard work, dedication, continuity of purpose, and career and college planning. But the programs that we studied had inadequate resources; given the pressure to maintain good relations with employers and find placements for graduates and interns, some schools weeded out the weaker students and devoted school resources to the remainder. Stronger students got the full benefits of the career magnet experience; weaker students got a program not much different from the comprehensive schools. No school reform can survive poor implementation.

The results of this study must be considered in the light of another unexpected finding: while the career magnets that made heavy use of computers saw gains in achievement test scores of considerable magnitude, that was the exception. In general, the career magnets' test scores were slightly lower than those in the comprehensive schools. The primary goal of the school should be to prepare adolescents to succeed in adult work and higher education. The schools that did this well did so without raising test scores, which convinces us that test scores are overrated as a measure of the quality of education. Our finding—that test scores were not markedly lower in the

career magnets—should reassure educators who feared that introducing a new focus in high school would create an achievement decline.

Moreover, it is encouraging that the benefits that did occur were achieved without much radical change in the classroom or in the overall structure of the schools. The study found little integration of careers within the academic classroom, and not much evidence that academic material was incorporated in the students' career preparation. For policy makers, this suggests that effective school-to-work programs can be created for at least some students without subjecting the high school to radical surgery. School districts that wish to create exceptional programs need to use outcome-based evaluation and take administrative action to correct the kind of implementation failures that we found. Assessing all of our data, we conclude that the career magnet programs we studied are a promising model. They are inexpensive, attractive to both students and teachers, and, if implementation is even moderately well done, have high pay-offs for many students. But effective implementation is not automatic.

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